

STCG Subcon Subgroup Meeting Minutes

August 8, 2000

Introductions/Announcements (Arlene Tortoso)

Arlene opened the meeting. She announced that the next STCG Management Council meeting was scheduled for August 25. (It has since been postponed until September 28.) Also, the Carbon Tet ITRD Workshop is postponed until mid-to-late October.

Arlene noted that DOE-RL received the Duke Engineering proposal on the PITT, and they need more time to review it. They haven't seen anything on the PNNL modeling work yet, but a paper is being prepared that will be ready soon.

Arlene also discussed the status of the In Situ Gaseous Reduction (ISGR) treatability study. They drilled two wells to groundwater in order to find Cr(VI) in the vadose zone in the 100-D Area, near the old mixing tanks at the 100-DR facility. They didn't find anything in the vadose zone, but the concentration in the groundwater at one of the two drilling locations was 1600 ug/L. Then they moved down gradient to try to get closer to the source. Now they have stopped and the program is dead.

Larry Gadbois said that they should not abandon the ISGR approach. We could stop the pump-and-treat operation if we could eliminate the source. He suggested near-surface applications, or liquid waste disposal sites, or the 100-H Area, or the mile-long trench as alternate sites to drill. However, it was SCFA's decision to stop, because it costs a lot of money to drill the wells, and they were not successful in locating the source. Mike Thompson said that the mile-long trench might be a reasonable site after the first 15 feet are dug up. But we need a small area with a high concentration of Cr(VI) to make the technology cost-effective. We still have the long-term issue of how to deal with dilute Cr plumes at depths below 15 feet.

Review Minutes from Last Meeting (Facilitator)

The facilitator reviewed the minutes from the July 18, 2000 meeting. No changes were requested.

Update on Hanford Technology Deployment Center (HTDC) Ad Hoc Committee (Abdul Dada)

Abdul reported that the Ad Hoc Committee met on August 1 to discuss guidance to the Subgroups. The key action item for the committee is to obtain seed money for technology demonstrations/deployments at Hanford (\$0.5-2.0M/year), starting on a pilot basis. BHI and FHI were asked to provide 2-3 proposals each. Then Debbie Trader's organization will select one or two to forward to DOE-RL management to try to get money for this year. BHI is submitting two proposals – one from Subcon (the use of laser drilling with the cone penetrometer) and one from

D&D (a recent ASTD proposal that did not get funded).

Vadose Zone Monitoring of the Hanford Site Surface Barrier (Andy Ward)

Andy presented the following key problem areas in barrier technology:

- Complex-wide
 - Significant performance monitoring not being done
 - Functional life has not been established
 - Performance not adequately studied
- Hanford-specific
 - Uncertainty in projecting performance to 1000 years
 - Uncertainty in side-slope hydrologic performance
 - Uncertainty in stability of above-grade covers

The Site needs addressed in this TTP include:

- Long-Term Testing of Surface Barriers (RL-WT017, RL-WT018)
- Moisture Flow and Contaminant Transport in Arid Conditions (RL-WT035-S)
- CERCLA RI/FS Treatability Test Report (DOE/RL-99-11) recommendations
 - Reliable, automated technologies for monitoring water storage
 - Data to support verification of predictive models
 - Determination of actual storage capacity of the fine soil layer

The purpose of the current proposal is to:

- Close knowledge gaps on long-term performance
 - Performance baseline
 - Aging
 - Stability
 - Water and energy balances that influence performance
- Development of accurate conceptual models of field-scale performance
- Demonstrate and evaluate technologies for field-scale monitoring
 - Traditional technologies
 - New geophysical techniques
- Establish a database for Complex-wide access

Mike Thompson said that we must be able to trust the barrier, and we need reliable long-term monitoring systems to foster this trust.

Hydrologic Characterization of Hanford's Vadose Zone at Representative Sites (Andy Ward)

The Hanford vadose zone is “virgin territory”. There is uncertainty in many aspects of flow and transport (plume distributions, conceptual models, future predictions, risk analysis). The TTP addresses the following Site needs:

- Use of representative field site data to identify controlling features and mechanisms for

transport (RL-SS27)

- Understanding and quantifying vadose zone water and contaminant movement (RL-SS30)
- Advanced characterization methods to delineate contaminant plumes (RL-SS31).

Andy presented an estimated range of recharge rates for various surface conditions on the Hanford Site. The recharge rate is 50-100 mm/year on a bare surface (such as tank farms), 0-10 mm/year on grasses, and less than 0.1 mm/year on shrubs. Advanced tensiometers have been deployed at seven meters depth using the cone penetrometer. They will be looking at a variety of geophysical tools (through-casing resistivity, high-resolution resistivity, flux meters, neutron probe, and advanced tensiometers) to interrogate large volumes of soil in order to get information on plume distribution.

New Integrated S&T Needs for the GW/VZ Risk Element (Amoret Bunn)

Mark Freshley introduced Amoret Bunn and stated that she led a team of experts on risk assessment in updating the GW/VZ S&T Roadmap to include the Risk Element. Amoret discussed the following four new “integrated” S&T needs:

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| RL-SS43 | Improvements to Ecological Risk Assessments and Analysis of Population-Level Impacts |
| RL-SS44 | Improvements to Human Health Risk Assessments |
| RL-SS45 | Establishing Technical Basis for Socio-Economic Risk Assessments |
| RL-SS46 | Modeling Risk Knowledge |

These needs address specific technical gaps identified in the scope of the Hanford GW/VZ Integration Project and are written as “integrated” needs. The Integration Project is focused on providing the scientific and technical basis to ensure that Hanford Site decisions, including decisions related to long-term stewardship, are defensible and possess an integrated perspective for the protection of the water resources, the Columbia River, river-dependent life, and users of the Columbia River resources. As such, these “integrated” needs summarize a number of S&T components that together address specific technical gaps. Amoret distributed copies of the four S&T needs statements that contain detailed descriptions of the new needs.

Risk Assessment includes the following main components:

- I. Hazard Identification – Is a harmful contaminant present?
- II. Exposure Assessment – How does the contaminant get into a human?
- III. Dose-Response Assessment – Once it’s in, what happens inside the body?
- IV. Risk Characterization – How much of what risk could result if exposed?

Gordon Rogers said that he is in favor of getting more scientific information on risks. People tend to respond more to “scary stuff” than to facts and rules. Perceived risks are “real”. We need to determine how people are using the river and the land. Mike Thompson agreed and said that DOE has an obligation to educate members of the public who use the Hanford Reach and the Hanford Site.

Protecting the Ogallala Aquifer at Pantex (Tyler Gilmore)

It was a significant event when TCE was found in the Ogallala Aquifer, a large regional aquifer that runs from Texas to Nebraska. DOE-HQ sent two Technical Assistance Teams to Pantex to deal with the problem. Bill Richardson wanted the teams based on the positive outcome of a previous assignment at Paducah.

The first team, which went to Pantex in May 2000, needed to find the source term. The contamination was heading toward the Amarillo wellfield a mile away. They originally thought the Burning Grounds site was the source, but they found no trace of TCE in the soil, so that source term was suspect. Additional wells were drilled up gradient, and they discovered acetone and toluene in the groundwater. The old Army base nearby was the potential source.

The second team went to Pantex in June 2000 to deal with RDX, TCE, and Cr(VI) in the Southeast Plume. This plume had resulted in significant contamination in the Perched Aquifer. Groundwater modeling work already existed for the site. They started an interim action pump-and-treat operation. The contamination had moved offsite and RDX was found in a private homeowner's well. The pump-and-treat operation wasn't doing anything to stop the contamination from moving offsite.

The existing subcontractor had already been asked to develop remediation strategies, and DOE's Technical Assistance Team reviewed all their information. The subcontractor had recommended the following technologies:

- Enhanced bioremediation of TCE and reduction of Cr
- Oxidation with permanganate injection
- Pump and treat
- Monitored natural attenuation.

The Technical Assistance Team had some major issues with this combination of technologies and their byproducts. Also, one technology negated another (i.e., oxidation and reduction being used side by side). The team recommended that they remove the source term first, and an ITRD Project was established for the groundwater. Technologies considered for source term removal were:

- In situ gaseous reduction
- Reactive wells
- Bioremediation
- Ozone oxidation

Technologies considered for passive remediation included:

- In situ redox manipulation
- Zero-valent iron injection to create a barrier

SCFA-Related Projects at Hanford (Scott Petersen)

Scott provided the following overview of SCFA-related funding at Hanford (with funding

amounts), including activities that are currently funded, activities with funding committed, and activities with funding likely.

Currently Funded:

- Enhanced Site Characterization System (618-4 burial ground)
- In Situ Redox Manipulation (ISRM) for Groundwater Remediation
- Laboratory Technical Support (technical support from PNNL to SCFA; ERC is starting on its fourth one)
- In Situ Chemical Treatment of Soils by Gaseous Reduction
- JCCEM Contaminant Transport Studies (ongoing for five years at a Russian site)
- Washington Advisory Group on Vadose Zone
- Bechtel Hanford Technical Support (Jerry White)

Funding Committed:

- Vadose Zone Monitoring of the Hanford Site Surface Barrier (TTP discussed earlier by Andy Ward)
- Hydrologic Characterization of the Hanford Vadose Zone at Representative Sites (GW/VZ Project) (TTP discussed earlier by Andy Ward)

Funding Likely:

- Subsurface Contaminant and In Situ Remediation Projects – Groundwater Monitoring (for MSE TTP to develop and deploy in situ sensors for Sr-90 and maybe Cr(VI) and carbon tetrachloride)
- Subsurface Contaminant and In Situ Remediation Projects – Investigate 200-Area Uranium Plume (for MSE conceptual models of uranium transport in the vadose zone and the groundwater). This is an active remediation site, so DOE and the regulators must approve it. Local interest could help get it funded.
- Demonstration of Innovative, Improved Field Methods for In Situ Delineation and Assessment of Contamination Located in Difficult Subsurface Conditions at DOE Sites (MSE in situ detection of carbon tetrachloride and deep access)

Supersaturated Grout (Scott Petersen)

In December 1999, Mike Truex evaluated a Technology Application Screening Summary for supersaturated grout, a technology available from Dr. Gerald Ziegenbalg of Freiberg University in Germany. Supersaturated grout formations are solutions that are oversaturated with slightly soluble sulfates or carbonates and stabilized for a specific length of time using precipitation inhibitors. The grout can be injected into a subsurface formation to immobilize contaminants as it eventually precipitates out on mineral surfaces. The grout materials offer the possibility to combine the formation of a hydraulic barrier with in situ immobilization of contaminants. Potential applications at Hanford include immobilization of Sr-90 in the vadose zone and immobilization of chromium or radionuclides where needed to close soil sites after excavation. The baseline technology is excavation or containment by pump and treat.

Action Items

1. Find a meeting room for the Carbon Tet ITRD Workshop in mid-to-late September (Facilitator). Done.
2. Get copy of MSE draft TTP for Mike Thompson and Dib Goswami (Wayne Martin).

Attendees

Bill Bonner (PNNL)
Amoret Bunn (PNNL)
Craig Cameron (EPA)
Abdul Dada (BHI)
Linda Fassbender (PNNL)
Mark Freshley (PNNL)
Larry Gadbois (EPA)
Glendon Gee (PNNL)
Judit German-Heins (Nez Perce Tribe)
Tyler Gilmore (PNNL)
Dib Goswami (Ecology)
Ron Jackson (BHI)
Wayne Martin (PNNL)
Scott Petersen (BHI/TA)
Gordon Rogers (HAB)
Mike Thompson (DOE-RL)
Arlene Tortoso (DOE-RL)
Andy Ward (PNNL)
Rob Yasek (DOE-ORP)

Wrap-Up (Arlene Tortoso)

The next Subcon Subgroup meeting is scheduled for September 14 in Room 1B-40 of the Bechtel Building. Candidate agenda items include:

- Status Report on Selected S&T Needs (Scott Petersen)
- Baseline Updating Guidance (Jim Hanson) and TIPs for High-Priority S&T Needs (Abdul Dada)
- Report on Gerald Boyd's Senior Management Council (Jerry White)
- FY01 Revisions to Existing S&T Needs (Mike Truex)